Answer on Question #71940 Math / Calculus

Obtain all the first second order partial derivatives of the function $f(x,y) = x^2 \sin y + y^2 \cos x$

Solution:

$$f(x,y) = x^2 \sin y + y^2 \cos x$$

The first order partial derivatives

$$\frac{\partial f}{\partial x} = 2x \sin y - y^2 \sin x$$

$$\frac{\partial f}{\partial y} = x^2 \cos y + 2y \cos x$$

The second order partial derivatives

$$\frac{\partial^2 f}{\partial x^2} = 2 \sin y - y^2 \cos x$$

$$\frac{\partial^2 f}{\partial y^2} = -x^2 \sin y + 2 \cos x$$

$$\frac{\partial^2 f}{\partial x\, \partial y} = \frac{\partial^2 f}{\partial y\, \partial x} = 2x \cos y - 2y \sin x$$